

Notice of Allowability

Application No.

09/872,776

Examiner

Mark Ruthkosky

Applicant(s)

HERRON, THOMAS G.

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/20/2004.
2. ☒ The allowed claim(s) is/are 1-47.
3. ☒ The drawings filed on 01 June 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Mark Ruthkosky
9/30/04

DETAILED ACTION

Response to Amendment

The applicant's amendment filed 7/20/2004 has been entered into the application file.

Claim Rejections - 35 USC § 102

The rejection of claims 1, 2, 5-26, 35 and 43 under 35 U.S.C. 102(b) as being anticipated by Meltser et al. (US 5,763,113) has been overcome by the applicant's amendment.

The rejection of claims 1, 2, 5-31, 35-39 and 43 under 35 U.S.C. 102(b) as being anticipated by Perry, Jr. et al. (US 5,316,869) has been overcome by the applicant's amendment.

Claim Rejections - 35 USC § 103

The rejection of claims 3-4 under 35 U.S.C. 103(a) as being unpatentable over Meltser et al. (US 5,763,113) OR Perry, Jr. et al. (US 5,316,869) has been overcome by the applicant's amendment.

The rejection of claims 32-34 and 40-42 under 35 U.S.C. 103(a) as being unpatentable over Meltser et al. (US 5,763,113) OR Perry, Jr. et al. (US 5,316,869) in view of Matusumura et al. (US 5,993,984) has been overcome by the applicant's amendment.

Allowable Subject Matter

Claims 1-47 are allowed.

The following is an examiner's statement of reasons for allowance:

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The instant claims are to a fuel cell system comprising:

a source of hydrogen gas;

a fuel cell stack including at least one fuel cell including an anode chamber and a cathode chamber, wherein the fuel cell stack is adapted to receive a flow containing hydrogen gas from the source, and to produce an electric current therefrom, and wherein the anode chamber is adapted to receive at least a portion of the flow containing hydrogen gas from the source;

a purge assembly including at least one purge valve adapted to selectively purge the anode chamber of the at least one fuel cell to reduce the concentration of a selected composition therein with a stream containing at least a portion of the flow containing hydrogen gas from the source;

a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack; and

a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value.

Fuel cell systems are well described in the prior art. The systems include a source of hydrogen gas, a fuel cell stack including at least one fuel cell including an anode chamber and a cathode chamber, with the fuel cell stack adapted to receive a flow containing hydrogen gas from the source and to produce an electric current therefrom, and wherein the anode chamber is adapted to receive at least a portion of the flow containing hydrogen gas from the source. Purge assemblies including at least one purge valve adapted to selectively purge the anode chamber of

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the at least one fuel cell to reduce the concentration of a selected composition therein are also taught in the prior art.

The prior art does not teach a fuel cell system, as claimed, with a purge assembly including at least one purge valve adapted to selectively purge the anode chamber of the at least one fuel cell to reduce the concentration of a selected composition therein with a stream containing at least a portion of the flow containing hydrogen gas from the source, a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack, and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value.

The most pertinent prior art has been cited. Meltser et al. (US 5,763,113) teaches a fuel cell system comprising a source of hydrogen gas; a fuel cell stack adapted to receive the flow of hydrogen gas to produce an electric current therefrom; a purge assembly including at least one purge valve adapted to selectively purge the fuel cell stack to reduce the concentration of a selected composition therein; a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack; and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value. Various parameters are monitored to determine the measures taken to adjust the fuel cell in operation including flow rate, hydrogen concentrations, current, stack voltage, change in stack voltage, voltage between individual cells, power demand and hydrogen leakage. Sensors are connected to a controller, such as a digital CPU, which stores, compares and calculates data (col. 5.) The user is alerted of fuel cell malfunction by a signal, alarm or light and appropriate action is taken (col. 4, lines 40-50.)

Meltser et al. (US 5,763,113) does not teach a fuel cell system, as claimed, with a purge assembly including at least one purge valve adapted to selectively purge the anode chamber of the at least one fuel cell to reduce the concentration of a selected composition therein with a stream containing at least a portion of the flow containing hydrogen gas from the source, a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack, and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value.

In addition, Perry, Jr. et al. (US 5,316,869) teaches a management system for a fuel cell comprising a source of hydrogen gas, a fuel cell stack including at least one fuel cell adapted to receive a flow containing hydrogen gas from the source to produce an electric current therefrom, a purge assembly including at least one purge valve adapted to selectively purge the fuel cell stack to reduce the concentration of a selected composition therein, a sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value. The system includes a CPU with values input from the operator to control the function of the system. A hydrogen storage unit is noted, which may also include a hydride system. The system may be used in conjunction with PEM and alkaline fuel cells.

Perry, Jr. et al. (US 5,316,869) does not teach a fuel cell system, as claimed, with a purge assembly including at least one purge valve adapted to selectively purge the anode chamber of the at least one fuel cell to reduce the concentration of a selected composition therein with a stream containing at least a portion of the flow containing hydrogen gas from the source, a

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sensor assembly including at least one sensor adapted to measure a value of a process parameter representative of the performance of the fuel cell stack, and a controller adapted to actuate the purge assembly if the value of the process parameter exceeds a determined value.

As the prior art does not teach a fuel cell system, as noted and claimed, the claims are allowed. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky

Primary Patent Examiner

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Mark Ruthkosky
9/30/04